Louisiana Energy Indicators

Center for Energy Studies

Louisiana State University Fall 1983

FUEL CONVERSION AND VALUE

Commercial generation of electrical power in Louisiana began in 1881. Over the past century, its importance in our homes and workplaces has become so pervasive that what was once a luxury is now indispensable to our daily lives.

The thermal generation of electricity relies on a primary energy source, such as coal, oil, natural gas, or uranium. To compare their efficiencies in the generation process, it is important to compare the heat and dollar value of each fuel. The prices of these fuels, however, are usually quoted per physical unit (dollars per barrel of oil, ton of coal, or thousand cubic feet of natural gas). Because these units are not easily compared, the heat value of each fuel is expressed in a standard unit, such as a calorie or British thermal unit (Btu). A calorie (a metric measure) is the amount of heat required to raise the temperature of one gram of water by one degree Centigrade. A Btu is the amount of heat required to raise the temperature of a pound of water by one degree Fahrenheit. One Btu equals about 252 calories. The Btu values of major fuels are given in Table 2 along with their cost, expressed in cents per million Btu's.

In thermal generation processes (as opposed to hydroelectric generation), the fuel is used to heat water to produce steam which, in turn, drives the turbines which produce electricity. Electricity is measured in watts or watthours (which tell the amount of work that can be done by the electricity). It takes approximately 10,000 Btu's of fossil fuel to produce 1,000 watthours (1 kilowatthour) of electricity. When delivered to the user, this same amount of electricity can produce only 3,412 Btu's of heat. Evaluated in this manner, two-thirds of the heat value of the primary fuel is lost in the generation and transmission processes.

Table 2. Fossil Fuel Heat and Dollar Value Comparisons, December 1982

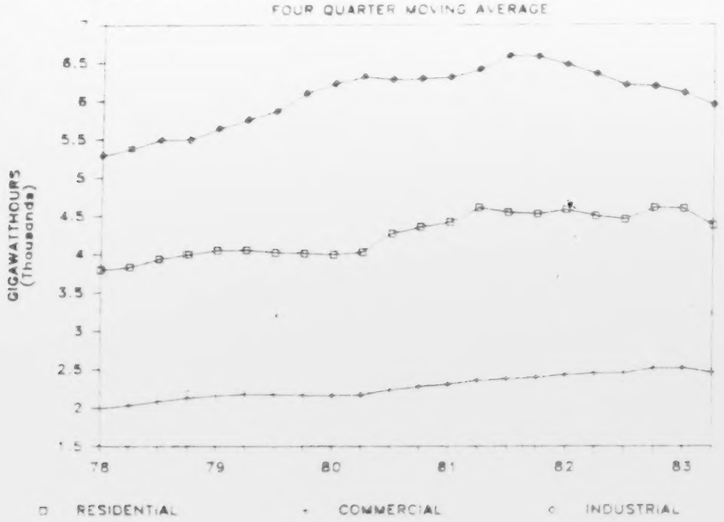
Fuel	Btu Content	Average Cost to Electric Utilities	Cost per 10 million Btu 10^6 Btu
1 barrel crude oil	5.8 million	$25.79 per Bbl	$4.45
1 short ton coal	22.59 million	$38.72 per Ton	$2.30
1 Mcf gas	1.021 million	$3.21 per Mcf	$3.14

Source: *Electric Power Monthly*, December 1982

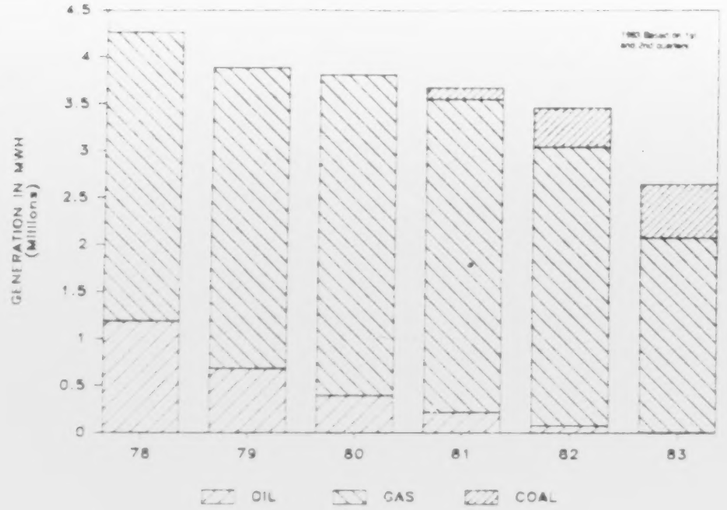
Table 1. Selected Energy Equivalents (Adapted from *Annual Energy Review 1982*)

Energy Unit	Bbls Crude Oil	Tons of Bituminous Coal	Tons of Lignite	Mcf Natural Gas	1000 kWh Electricity	Million Btu
1 Bbl crude oil =	—	0.24	0.45	5.7	1.70	5.8
1 short ton bituminous =	4.14	—	1.85	23.5	7.04	24.0
1 short ton lignite =	2.24	0.54	—	12.74	3.80	13.0
1 Mcf natural gas =	0.18	0.04	0.08	—	.3	1.02
1000 kWh electricity =	0.59	0.14	0.26	3.34	—	3.4

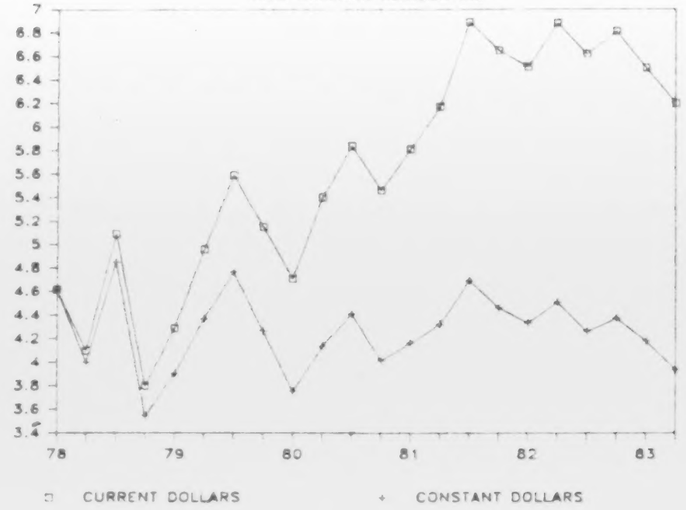
ELECTRICITY SALES BY CUSTOMER CLASS



ELECTRICITY GENERATION BY FUEL TYPE



ELECTRICITY PRICES PER KILOWATT HOUR



Historical Presentation—Electricity

	77.1	77.2	77.3	77.4	78.1	78.2	78.3	78.4	79.1	79.2	79.3	79.4	80.1
ELECTRICITY PRODUCTION (Gigawatts)													
Gas generated	7.01	8.54	11.12	8.51	7.15	9.29	11.75	11.81	8.08	10.59	11.28	8.42	8.99
Oil generated	3.91	3.47	3.38	2.47	4.47	3.44	3.69	2.65	3.27	1.57	1.18	1.51	1.15
Coal generated	0	0	0	0	0	0	0	0	0	0	0	0	0
Total generation	10.92	12.01	14.50	10.98	11.62	12.73	15.44	14.46	11.35	12.16	12.46	9.93	10.14
RETAIL Residential PRICE/ KWH (¢) New Orleans	4.52	4.57	4.71	3.96	4.62	4.10	5.09	3.80	4.29	4.96	5.59	5.15	4.71
ELECTRICITY CONSUMPTION (Gigawatts)													
Residential	2.62	3.23	5.71	3.23	3.02	3.38	6.13	3.79	3.23	3.39	6.00	3.44	3.16
Commercial	1.62	1.89	2.39	1.89	1.79	2.04	2.60	2.08	1.91	2.11	2.58	2.05	1.90
Industrial	4.88	8.24	5.35	5.33	5.22	5.60	5.83	5.33	5.80	6.06	6.29	6.25	6.31
Other	0.77	0.86	0.92	0.88	0.80	0.89	0.98	0.92	0.93	0.99	0.86	0.93	0.88
Total	9.89	14.22	14.37	11.33	10.83	11,91	15.54	12.12	11.87	12.55	15.73	12.67	12.25

	80.2	80.3	80.4	81.1	81.2	81.3	81.4	82.1	82.2	82.3	82.4	83.1	83.2
ELECTRICITY PRODUCTION (Gigawatts)													
Gas generated	9.46	12.67	9.78	8.53	10.49	11.93	8.97	8.83	9.38	9.91	7.46	5.78	6.64
Oil generated	1.51	1.66	0.46	1.22	0.52	0.82	0.07	0.38	0.47	0.04	0.04	0	0.02
Coal generated	0	0	0	0.06	0.52	0.73	0.21	0.26	1.03	1.95	1.73	1.75	1.66
Total generation	10.97	14.33	10.24	9.81	11.53	13.48	9.25	9.47	10.88	11.90	9.23	7.53	8.32
RETAIL RESIDENTIAL PRICE/ KWH (¢) New Orleans	5.40	5.84	5.46	5.81	6.17	6.89	6.65	6.51	6.88	6.62	6.81	6.50	6.20
ELECTRICITY CONSUMPTION (Gigawatts)													
Residential	3.51	6.97	3.79	3.40	4.26	6.73	3.70	3.64	3.92	6.56	3.85	3.59	3.53
Commercial	2.12	2.87	2.22	2.01	2.32	2.97	2.28	2.16	2.41	2.98	2.39	2.16	2.31
Industrial	6.39	6.16	6.30	6.38	6.79	6.86	6.26	5.98	6.30	6.27	6.13	5.63	5.77
Other	0.92	1.00	0.93	0.99	1.04	1.11	1.03	0.92	1.03	1.10	0.98	0.98	1.00
Total	12.94	17.00	13.24	12.78	14.41	17.67	13.27	12.70	13.66	16.91	13.35	12.36	12.62

FOOTNOTES

1. A change in DNR surveying practices is partially responsible for the drop in the number of rigs in 1983, especially in the north.

2. Reflects rate increase granted SWEPCO by the PSC, April 19, 1982.

3. Industrial Sale Price by Major Interstate Pipeline Companies.

4. Intrastate A price was computed as the weighted average price charged by Louisiana Intrastate, Monterey, and Sugar Bowl gas transmission companies. Intrastate B was computed by adding Texaco (27% market share at 34¢/MCF) to Intrastate A. Data on Texaco was taken from Foster and Associates, The Impact of NGPA on Intrastate Markets in Louisiana, 1982. Data on the other three companies was supplied by the Louisiana Public Service Commission.

5. Heating degree days are deviations of the mean daily temperature below 65°F.
Cooling degree days are deviations of the mean daily temperature above 65°F.
(Ex. When a recorded mean daily average is 80°F, cooling degreedays would be 15 and heating degree days, 0; for a 40°F, heating degreedays would be 25 and cooling degreedays, 0.)

SOURCES OF LOUISIANA ENERGY INDICATOR DATA

Publications

Electric Power Monthly. U.S. Dept. of Energy, Energy Information Administration, Office of Coal, Nuclear, Electric, and Alternate Fuels.
- Electricity Production and Consumption Data

Employment and Total Wages Paid by Employers Subject to the Louisiana Employment Security Law. Louisiana Dept. of Labor, Office of Employment Security, Research and Statistics Unit. Quarterly.
- Wages, Number of Establishments, Employment Data

Louisiana Climatological Data. U.S. Dept. of Commerce, National Weather Service. Monthly.
- Heating and Cooling Degree Days (Not in this issue)

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- Employment Data

Louisiana Petroleum Activity Report. Monthly.
- Drilling Rig Activity, Oil and Gas Production, Refinery Runs and Stocks Data

Monthly Energy Review. U.S. Dept. of Energy, Energy Information Administration. Monthly.
- Crude Oil Prices, Interstate Natural Gas Price Data

Monthly Motor Gasoline Reported by States. U.S. Dept. of Transportation. Monthly.
- Gasoline Consumption

Oil and Gas Journal. Penn Well Publishing Company, Tulsa, Oklahoma.
- Gasoline Prices

Weekly Petroleum Status Report. U.S. Dept. of Energy, Energy Information Administration.
- Crude Oil Prices

Other Sources

Louisiana Public Service Commission.
- Unpriced Data
- Electricity Prices

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- Taxes and Revenues

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